

# ESKRIDGE (J. T.)

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MEDICUS

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SPINAL CORD, AND PROBABLY OF THE  
NERVES OF THE LEGS,

*Followed by Hysterical Contractures of the Flexors of the Knees,  
and a Pronounced Variability of Certain Reflexes.*

BY

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PROFESSOR OF NERVOUS AND MENTAL DISEASES IN THE UNIVERSITY OF COLORADO,  
NEUROLOGIST TO THE ARAPAHOE COUNTY AND ST. LUKE'S HOSPITALS.



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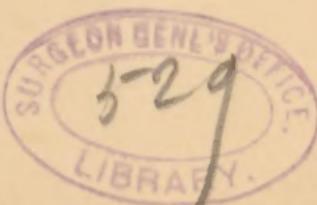
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PROFESSOR OF NERVOUS AND MENTAL DISEASES IN THE UNIVERSITY OF COLORADO, NEUROLOGIST TO THE ARAPAHOE COUNTY AND ST. LUKE'S HOSPITALS.

THE patient before us has presented many puzzling and contradictory features since he first entered this hospital, about nineteen months ago. The history and results of repeated examinations are as follows:

William T., a male, thirty-two years of age, married, a bartender by occupation, born in England, but residing in Colorado two years, was admitted into this hospital April 26, 1893. The family history, with the exception that his father died of heart-disease, is negative. The patient had measles when a small boy, and scarlet fever when twenty-three years old, has drunk heavily and lived irregularly, but denies syphilis, although he admits repeated exposures. He states that he was in good health for a number of years preceding the illness for which he was brought to the hospital. His illness began about the middle of April, 1893, by his feeling weak, languid, and generally indisposed. On admission he was feverish, and was placed under the care of the general physician,

<sup>1</sup> A clinical lecture delivered at the Arapahoe County Hospital.



who treated him a number of weeks for typhoid fever. During these weeks he was delirious much of the time, and did not at any time seem to be entirely conscious. As the temperature ran a very irregular course, and the fever did not subside nor the patient improve as time went on, I was asked to see him June 1, 1893, about five weeks after his admission into the hospital.

On studying the clinical chart kept of his case during the five weeks of his sojourn in the hospital before I first saw him, I found that the temperature varied greatly ; it was at times nearly normal, and at other times it was two or three degrees above normal, but usually remaining about  $99.5^{\circ}$  in the evening. The pulse vacillated from 100 to 120, and the respiration registered from 16 to 28 per minute.

Upon examination June 1, 1893, I found the patient lying in bed with the legs flexed at right angles to the thighs. On making a voluntary effort to extend the legs at the knees he succeeded in pushing the feet a few inches down toward the foot of the bed. The flexor muscles of the legs did not seem contracted, and on my attempting forced extension of the legs at the knees the legs could be almost completely extended without using much force, but they could not be straightened without causing the man to cry out with pain. There was present double partial foot-drop, but the tibialis anticus muscle of either side could be made to contract feebly and produce slight dorsal flexion of the foot. The peroneus muscles on either side were completely paralyzed. The man was unable to flex or extend any of the toes on either foot. The flexor, as well as the extensor, muscles of the knees were very weak. Complete extension and flexion of the thighs at the hips the patient was able to perform when he was lying on his side, but the hip-muscles were rather weak. The knee-jerks, the plantar, ankle-clonus, tendo Achillis, and cremaster reflexes were absent ; the abdominal reflexes were present ;

those of the right arm were about normal, of the left increased; no masseter reflex was present, and the iris-reflex was normal. The man was greatly emaciated; but there was no group of muscles that presented a degree of wasting out of proportion to others. Two bedsores, small and superficial in character, had formed, one over the sacrum and one over the right hip. Incontinence of urine and feces had existed since the patient was brought to the hospital, and the same condition persisted at the time I first examined him. It was very difficult to determine whether the incontinence of urine was due to organic disease of the cord or to the mental condition, as the man had presented during the entire time of his stay in the hospital a condition of mental dulness that prevented his notifying the nurses when he desired to pass water, if he was capable of appreciating such a desire. On expostulating with him about soiling the bed he would promise to call for the urinal, but the bed was always found soiled and the bladder usually empty. On inserting the finger into the rectum the sphincter of the anus was found not paralyzed, but the contents of the rectum found their way into the bed, as he failed to call for the bed-pan. All the muscles of the legs responded to the faradic current, those below the knee requiring a current nearly twice as strong as those of the arms, and a considerably stronger current than the thigh-muscles. Dynamometer R., 90; L., 110. The patient is left-handed.

*Sensory phenomena.* It was very difficult to arrive at any definite conclusions in regard to the exact state of general sensation, on account of the patient's enfeebled mental state. It required a very great effort for him to concentrate his mind; cerebration was slow, and he did not always seem to appreciate what was said to him. The first note on tactile sense was: "Tactile sense is greatly lessened on the feet, but not entirely lost; on the legs, over the external genitalia, and around the anus it

seems to be perfect." The second account of tactile sense, made about ten minutes after the first examination of this sense was concluded, was as follows: "When he is not agitated and his mind is concentrated upon what is being done, tactile sense seems to be fairly good over the feet, legs, external genitalia, and around the anus, with the exception of being slightly delayed." This sense was tested with a feather, both by holding it steadily against a part and by moving it gently. The senses of temperature, pain, posture, localization, and of the joints appeared about normal over the feet and legs. No disturbance of general sensation seemed to exist over the trunk, arms, or face. Smell and taste appeared normal. Hearing for the watch : R.,  $\frac{1}{2}$ ; L., on contact. The man stated that he had been nearly deaf in the left ear since his attack of scarlet fever ten years before. The tuning-fork was better heard in the left ear. The pupils were normal in size and reacted well to light and in accommodation ; the fields were normal so far as it was possible to determine ; and fundi and discs showed no evidence of disease. The urine was free from albumin and sugar, and no evidence of disease of the abdominal or thoracic viscera was detected.

On August 14, 1893, about two months after the first examination the following notes were made: "His general condition has very much improved, his mind has been clear for the last month. His legs were forcibly extended at the knees about six weeks ago, and kept in this position by means of posterior splints to the legs for two weeks. He complained of some pain in the knees and posterior thigh-muscles during this time, but the inconvenience was not sufficient to keep him from sleep. On removing the splints the legs resumed their original position at right angles with the thighs, but the contractures do not seem to have increased. No contraction of any other muscles exists. The bedsores healed in about two weeks from the time attention was first directed

to them. During the last four weeks, or since his mental condition became normal, he has been able to control the bladder and bowels. The sensory functions are a little more impaired than was found in the first examination. Over the feet and scrotum, on the glans penis, and around the anal region lessened tactile sense is quite perceptible. There seems to be only slight impairment of this sense on any portion of the legs. Other forms of general sensation appear a little delayed. The plantar reflexes have returned and are exaggerated; knee-jerks, ankle-clonus, and the reflexes of the tendo Achillis are absent. Cremaster, R. is decided; L. absent, or nearly so; the other reflexes are as noted on the former examinations."

The man continued to improve in muscular strength and general appearance, and, with the exception of the flexor contractures at the knee-joints and the weakness of the dorsal flexors of the feet and extensors of the toes, he seemed in an excellent condition. Forced extension of the legs at the knees was tried, but he said it gave him so much pain in the knees that but little force was used, and the attempt was not repeated, as he refused to submit, although I offered to use an anesthetic. The pain that he complained of while extension of the legs was being tried he located in the interior of the knee-joints, and superficially just below the outer side of the kneecaps. On March 18, 1894, the flexor and extensor muscles of the knees and hips seemed to be strong. Plantar flexion of the feet could be practised with considerable force, but dorsal flexion was imperfect and weak. All the toes could be moved, the power of flexion being strong, but extension weak. All the muscles of the legs responded nearly normally to the faradic current, and muscular nutrition was excellent. The reflexes were nearly as stated at the second examination, except that both plantar and cremaster reflexes were exaggerated, and the abdominal reflexes were absent on

the right side. Dynamometer, R., 140, L., 142. Tactile sense was absent only on the glans penis. It was present and apparently normally acute over the other portions of the penis, over the scrotum and around the anal region. On the outer side of the ankles and over the dorsal surfaces of the toes it was lessened and delayed. Temperature-sense seemed a little delayed over the feet and ankles. All other forms of sensation were normal.

The examination of the patient to-day shows the muscular nutrition fairly well preserved, and the slight wasting of the muscles below the knee is not much greater than we should expect from nearly two years of disuse of these muscles. Electric reaction of all the muscles is about normal. The contractures of the flexor muscles of the knees remain about the same as was observed more than eighteen months ago. There are no contractures of any other group of muscles. All the muscles are strong, with the possible exception of the dorsal flexors of the right foot, and with these the patient is able to exert considerable force. There is no ataxia of the arms, and he is able to perform movements with his legs, while lying in bed, without any appearance of incoördinated motion. The dynamometer registers R., 136; L., 150. You will remember that he is left-handed. The plantar, ankle-clonus, tendo Achillis, and knee-jerk reflexes are absent; that of the cremaster is greatly exaggerated; the lower abdominal is absent; the epigastric, right is present, left is absent; those of the arms are normal or slightly increased; the special senses and all forms of general sensation appear about normal.

Now, gentlemen, from what has this man been suffering during the last nineteen months? Before trying to answer this question by a careful study and analysis of the numerous and complex symptoms presented by the case, let us note some of the more prominent features of the clinical history. A bartender, who is about

thirty-two years old, addicted to venereal and alcoholic excesses, and an irregular mode of living, after several years of apparently good health, begins, without any appreciable cause, to complain of general indisposition. Ten days later he is brought to the hospital in a weak, febrile state, the temperature very irregular, the mind clouded, and with incontinence of bladder and bowels. During the next six weeks he remains in practically the same condition. At this time an examination showed partial paralysis of the legs, more marked below the knees, slight sensory disturbance, especially in the distal portions of the legs, two pressure-bedsores superficial in character, and contractures of the flexor muscles of the knees; the knee-jerks, the plantar, tendo Achillis, cremaster, and lower abdominal reflexes are absent, and the epigastric present. A few weeks after placing him on large doses of mercuric chlorid great improvement was manifest. As soon as his mind became clear he was able to control the sphincters of the bladder and bowels. The bedsores, which had probably formed from inattention to the parts on which they were situated, healed readily. The flexor contractures of the knees persisted, with weakness of the dorsal flexors of the feet and lessened acuity of general sensation over the feet and legs. Considerable wasting of the muscles below the knees and lessened faradic irritability were present. There has been a gradual improvement in all his symptoms, except the contractures of the flexors of the knees, and to-day he would be considered practically a well man if it were not for the state of these contractured muscles. The knee-jerks, ankle-clonus, and the reflex of the tendo Achillis have remained absent throughout the course of the disease, while the plantar, cremaster, and abdominal reflexes have been variable.

The mental condition of the patient during the first two months of his stay in the hospital, and the state of the sphincters of the bladder and anus, in association

with the muscular paralysis, wasting and electric changes, and the peculiar distribution of the sensory changes, indicate, positively, organic changes affecting the central, and probably also the peripheral, nervous system ; yet there is, I think, a strong hysterical element in this case, as I shall endeavor to point out later on. What evidence have we of neuritis ?

The disturbances of sensation observed in this patient were always most pronounced over the feet and ankles, while around the anal region, over the external genitalia and on the posterior portions of the thighs and legs sensation was normal, or nearly so, most of the time. This distribution of partial anesthesia would not occur from a lesion in the lumbar or sacral segment of the cord. If the anesthetic areas of the feet had been due to a lesion in the lower segments of the cord, we should have found anesthetic areas on the outer and posterior portions of the legs and thighs, over the external genitalia, and a saddle-shaped area, including the parts immediately around the anus and extending up the spine, this area being so named from the included parts being those that come in contact with the saddle. A lesion above the lumbar enlargement of the cord might give rise to anesthesia around the feet and ankles without affecting sensation to the same extent around the anus and over the external genitalia, but in that event the deep reflexes (knee-jerks, ankle-clonus, and tendo Achillis) would be exaggerated. In this case we find all these absent. We owe considerable to the careful clinico-pathologic work done by Thorburn, Starr, and others, in the line of spinal-cord localization, especially with reference to the distribution of the areas of anesthesia associated with the involvement of the different segments of the cord. These observations are of special importance in enabling us to distinguish areas of anesthesia due to lesions of nerves from those of the cord. We are forced to conclude that no matter what other trouble this patient has had

he has also suffered from multiple neuritis affecting only the legs. The distal portion of these limbs being mainly involved, the tendency to foot-drop, with complete paralysis of the peroneus longus muscle, and almost complete loss of power in the tibialis anticus, absent knee jerk, and the variable condition of the plantar reflexes, are in keeping with the symptoms of multiple neuritis. Multiple neuritis usually affects the arms as well as the legs, but there are a number of exceptions to this rule, and I think they are most commonly found in persons addicted to the excessive use of alcohol.

The symptoms that point to disease of the spinal cord which could not be accounted for on the theory of ordinary multiple neuritis, are weakness of the hip muscles, slight disturbance of sensation over the external genitalia and around the anal region, incontinence of the bladder and bowels, the formation of bedsores and contractures of the flexor muscles of the knees. Some of the symptoms just mentioned require further consideration at this time before accepting them as evidences of disease of the spinal cord in this case.

You will remember that I told you, while relating the history of this patient's illness, that I found it almost impossible at one time to say whether the incontinence of the vesical sphincter was due to a lesion in the spinal cord or to mental impairment; as the incontinence of urine ceased as soon as the mind cleared up, without any tendency to involuntary discharge of the bladder since, it seems quite probable that this condition was due to the mental state of the patient. Paralytic incontinence was excluded from the fact that the usual areas of distinct anesthesia around the anus and over the external genitalia were absent. The absence of flaccidity of the leg-muscles would also aid in excluding paralytic incontinence of the bladder. Insertion of the finger into the rectum showed that the sphincter of this orifice was active. The question arose whether we had a lesion

of the cord above the lumbar enlargement sufficient to cause loss of control of the bladder and bowels and to give rise to reflex incontinence of urine, or what the elder Gross termed, when applied to the bladder, "incontinence of retention," a condition for which Gowers has suggested the name "incontinence of overflow." In a case of lesion of the spinal cord above the lumbar enlargement, uncomplicated by neuritis, it would not be difficult to determine whether or not the incontinent state of the sphincters was due to mental failure or to loss of the power of their control, as such a lesion of the cord would be attended with an increase of all deep reflexes in the parts innervated by that portion of the cord lying below the seat of the lesion. In the present instance the inflammation that we have concluded involved the nerves of the legs very much complicated matters by abolishing those reflexes by the presence of which we should have been greatly aided in arriving at an accurate diagnosis. The flexor contractures of the knees themselves would indicate an affection of the pyramidal tracts of the cord; but here again there have been no contractures of the hip-muscles and none of the leg-muscles below the knees, although the calf-muscles have regained almost normal strength. Against the view of a transverse lesion of the dorsal portion of the cord is the fact that there has been no involvement of the trunk-muscles, and no area of anesthesia or hyperesthesia has been found on the trunk; neither has the man complained, at any time, of a band-like sensation around the trunk. The bedsores, one over the sacrum and one over the right hip, healed very rapidly as soon as attention was directed to them, suggesting that they were due more to pressure and want of proper care than to any trophic disturbance in the cord. I have already stated that I am not inclined to attribute the contractures of the flexor muscles of the knees to degeneration in the cord, from the fact that the associated symptoms are very different from those due to

distinctive lesions of the cord. In extensive lesions of the cord causing degeneration of the pyramidal columns there would be at first extensor contraction of the muscles of the ankles and knees, and when flexor contractures take place these would involve the flexors of the hips as well as of the knees, but extreme extension of the feet at the ankle-joints would still persist. Besides, such a degree of flexor contractures of the knees as we find in this patient would in all probability be attended with more or less inability to control the bladder voluntarily at all times.

I think, then, that we may conclude that the contractures in this case are of an hysterical nature. The man's resisting with all his power any attempts to extend the legs, and his positive refusal to take an anesthetic in order that we might put his legs in a better condition, lend weight to this view, if any were needed. You may ask me what evidence have we that the spinal cord has been affected. The two principal points are weakness of the hip-muscles and slight disturbance of sensation over the external genitalia and around the anal region early in the course of the disease. If the trouble has not been a transverse, focal and diffuse myelitis, affecting the cord in any portion of its extent, in what has the lesion of the cord consisted? The exact pathologic condition must be hypothetic in a case of this kind. Two facts are evident: First, the trouble is limited to the lower portion of the cord; and, second, the affection, while sufficient to interfere with the function of this portion of the cord for some time, has not been of such a nature as to destroy the integrity of the functioning elements. Anemia from arterial degeneration and meningo-myelitis of syphilitic origin not infrequently affect the cord. While most cases of syphilis of the cord, as first pointed out by Erb, are more serious in their nature as far as the integrity of the cord is concerned, yet we may conceive that in the early stage of syphilis of the cord, if the destructive

process is arrested, function may be almost completely restored. In the cases of syphilis of the cord reported by Erb and Muchin the arms and the cranial nerves escaped. In these the deep reflexes were usually exaggerated, but, as we have seen in the case of the patient before us, the occurrence of neuritis has prevented the manifestation of such symptoms had the cord-trouble been severe enough to cause their development. Dr. Frank Fry, of St. Louis, has recently reported cases of supposed syphilis of the cord, in which the pain-sense and the temperature-sense were affected, while tactile sensibility remained nearly normal. I hope at some future time to be able to report a series of cases of cord-affections, now under my care, apparently due to syphilis.

The brain symptoms present in the early history of this case were those of partial dementia, without any involvement of the cranial nerves. Whatever the lesion has been there are at present no symptoms remaining. It is probable that the brain-symptoms were due to some interference with the nutrient cortical arteries of the convex surface of the brain. Thickening of the pia may have constricted the vessels supplying the cortical substance of the brain, and thus have diminished the blood-supply and impaired the functioning power of the cortical cells.

The probable cause of this man's trouble is syphilis or alcohol; or both may have exerted a deleterious influence on his nervous system. We have a history of chronic alcoholism, the alcohol-habit having been established early in life and continued until the beginning of his present illness. Syphilitic infection he denies, although he admits repeated exposures. The cerebral and spinal symptoms, occurring in the same case, as they have in the present instance, have been those most commonly attributed to syphilis, but the cephalic symptoms of themselves have been typical of what we not infrequently find to follow prolonged alcoholic indulgence. Multi-

ple neuritis is much more frequently due to alcohol than to syphilis. As we have a distinct history of alcoholism and a positive denial on the part of the patient of syphilis, you may be curious to know why I do not simply attribute the symptoms in this case to alcohol. Two reasons incline me not to ignore syphilis as an etiologic factor. One is that experience has taught me to lay but little stress on the denial of syphilis by persons given to indiscriminate sexual intercourse, and the other is that I do not remember having met with such a combination of nervous disturbances from alcohol alone as are presented by this patient. There is no doubt that chronic alcoholism renders the nervous system vulnerable to syphilis. Tamowski states that alcohol and heredity are the main factors predisposing to the localization of syphilis of the brain. It would be interesting to pursue the study of syphilis of the nervous system further, but my limited time prevents this at present. But one thought more on this subject, and I shall leave it. Charcot has called attention to the development of hysteria in the male apparently of purely syphilitic origin.

The variability of the superficial reflexes in this case is curious, and I do not remember having met with so marked an example of it before in the absence of obvious lesions to account for it. The deep reflexes of the legs have remained absent throughout the course of the disease. At the first examination, June 1, 1893, the plantar and cremaster reflexes were absent and the abdominal were present. At the time of the second examination, August 14, 1893, the patient's condition was very much improved, and the plantar reflexes had returned and were increased, while the right cremaster reflex was increased and the left absent, the abdominal still being present. On March 18, 1894, the improvement in the patient's condition was still more marked; the plantar and cremaster reflexes were exaggerated, and the abdominal on the right side were absent, on the left pres-

ent. To-day the patient presents no obtrusive symptoms of disease, except the possibly hysterical contractures of the flexor muscles of the knees; the plantar reflexes are absent, the cremasters are greatly exaggerated, the lower abdominal absent, the epigastric present on the right side and absent on the left. In hysteria I have observed a variable condition of the superficial reflexes, but not in so marked a degree as this case has presented.

Judging from present indications the prognosis of this case is good so far as the organic lesion of the nervous system is concerned, although a relapse is always to be apprehended. With regard to the contractures, so long as he refuses to submit to treatment improvement will probably not take place. There is a suspicion that he is nursing this condition as an excuse to remain in the hospital.

The treatment at the time the patient first came under my care was actively anti-syphilitic, at first by means of mercury, and later by the use of mercury and potassium iodid. Improvement, especially of the cerebral symptoms, was pronounced from the time this treatment was instituted, and this was presumable evidence, but not positive, of the syphilitic nature of part of his trouble.







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